Summer 2017 OIB LVIS/ B200T Flight Lines

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Introduction

The attached flight plans show a set of approaches to collecting data along OIB flight lines for the Summer 2017 Campaign. The campaign will be flown using the LVIS-F instrument mounted in a Dynamic Aviation B200-T airplane. Flight lines were provided by John Sonntag and are lines either flown by the P3 in the Spring Campaign or by the Falcon during the Summer 2016 Campaign. Each notional flight follows a subset of these lines doable using the Dynamic B200T airplane from either Thule or Kangerlussuaq airports. Note however that final flight plans may differ slightly as they will be created in response to conditions on the day of flight itself. The LVIS-F sensor (lidar, camera system) will be flown in the airplane at an altitude of 28,000'. The LVIS-F swath size is 1.7 km from 28,000' above the ground. The sensor will utilize 6m-diameter footprints contiguous in the along and across track directions. Full waveform data will be collected for each footprint.

Flight priorities are listed in Table 1, along with line priorities within a flight if they exist. Any remaining design/info needed for each plan is listed in Table 2. Note that this document shows 19 planned flights, which is more than we expect to fly. However, this list of flights gives us the operational flexibility to fly as much as possible once in the field.

Table 1: Sample flight plans, line priorities within each flight as designed, and approximate timing and other flight info.

Priority	Name	Departure	Arrival	Time (hr)	Narsarsuaq flex	Mission prioritization
High	ICESat-2 North / Petermann	Thule	Thule	5.5	N	Petermann flowline then max. ICESat-2 tracks
High	Northwest Coastal 1	Thule	Thule	4.4	N	Coastal then inland tracks, no regional priority
Low	Northwest Coastal 2	Thule	Thule	2.8	N	Coastal then inland tracks, no regional priority
Low	Northwest Coastal 3	Thule	Thule	5.6	N	Coastal then inland tracks, no regional priority
High	Zachariæ-79N	Thule	Thule	6.0	N	Glacier flowlines
High	Transit	Thule	Kangerlussuaq	5.0	N	Mop up sky-clear tracks along NW coast
High	Helheim-Kangerdlugssuaq 1	Kangerlussuaq	Kangerlussuaq	5.3	N	Glacier flowlines then coast-parallel tracks
Low	Helheim-Kangerdlugssuaq 2	Kangerlussuaq	Kangerlussuaq	4.5	N	Coastal then inland track, no regional priority
High	ICESat-2 Central	Kangerlussuaq	Kangerlussuaq	6.4	N	Coastal then inland track, no regional priority
High	ICESat-2 South 1	Kangerlussuaq	Kangerlussuaq	5.0	Y	Coastal then inland track, no regional priority
Low	ICESat-2 South 2	Kangerlussuaq	Kangerlussuaq	2.5	Y	Cross ice divide
High	Jakobshavn Coast	Kangerlussuaq	Kangerlussuaq	4.6	N	Coastal then inland track, no regional priority
High	Jakobshavn Inland	Kangerlussuaq	Kangerlussuaq	5.8	N	Coastal then inland track, no regional priority
High	K-Summit	Kangerlussuaq	Kangerlussuaq	5.9	N	K-transect & Summit region, then ICESat tracks
Low	Southeast Grid 1	Kangerlussuaq	Kangerlussuaq	5.6	Y	Coastal then inland track, no regional priority
High	Southeast Grid 2	Kangerlussuaq	Kangerlussuaq	5.2	Y	Coastal then inland track, no regional priority
High	Southwest Coastal 1	Kangerlussuaq	Kangerlussuaq	5.4	Y	Coastal then inland track, no regional priority
Low	Southwest Coastal 2	Kangerlussuaq	Kangerlussuaq	5.1	Y	Coastal then inland track, no regional priority
Low	Southwest Coastal 3	Kangerlussuaq	Kangerlussuaq	4.1	Y	Coastal then inland track, no regional priority
High	Umanaq	Kangerlussuaq	Kangerlussuaq	5.6	N	Coastal then inland track, no regional priority

Table2: Remaining design questions for lines within each flight.

| Priority	Name	Remaining design issues
High	ICESat-2 North / Petermann	
High	Northwest Coastal 1	Coast-most track ok wrt rock/ice %?
Low	Northwest Coastal 2	Note: Nwcoast missions to be designed wrt clouds on flight days
Low	Northwest Coastal 3	
High	Zachariæ-79N	At edge of range: Cut after crossing terminus and Camp Century if necessary
High	Transit	
High	Helheim-Kangerdlugssuaq 1	Glacier flowline needs checking with John
Low	Helheim-Kangerdlugssuaq 2	
High	ICESat-2 Central	
High	ICESat-2 South 1	Several lines available - will pick based on clouds
Low	ICESat-2 South 2	Several lines available - will pick based on clouds
High	Jakobshavn Coast	
High	Jakobshavn Inland	
High	K-Summit	
Low	Southeast Grid 1	At edge of range: but many options here with SEgrid2
High	Southeast Grid 2	
High	Southwest Coastal 1	Any regional priority possible here? Eg.
Low	Southwest Coastal 2	south of 62.5N highest,
Low	Southwest Coastal 3	62.5-65N next, then 65-67N (for replanning around clouds).
High	Umanaq	At edge of range: will shorten north ends of inland lines as needed

IceSat-2-North/Petermann

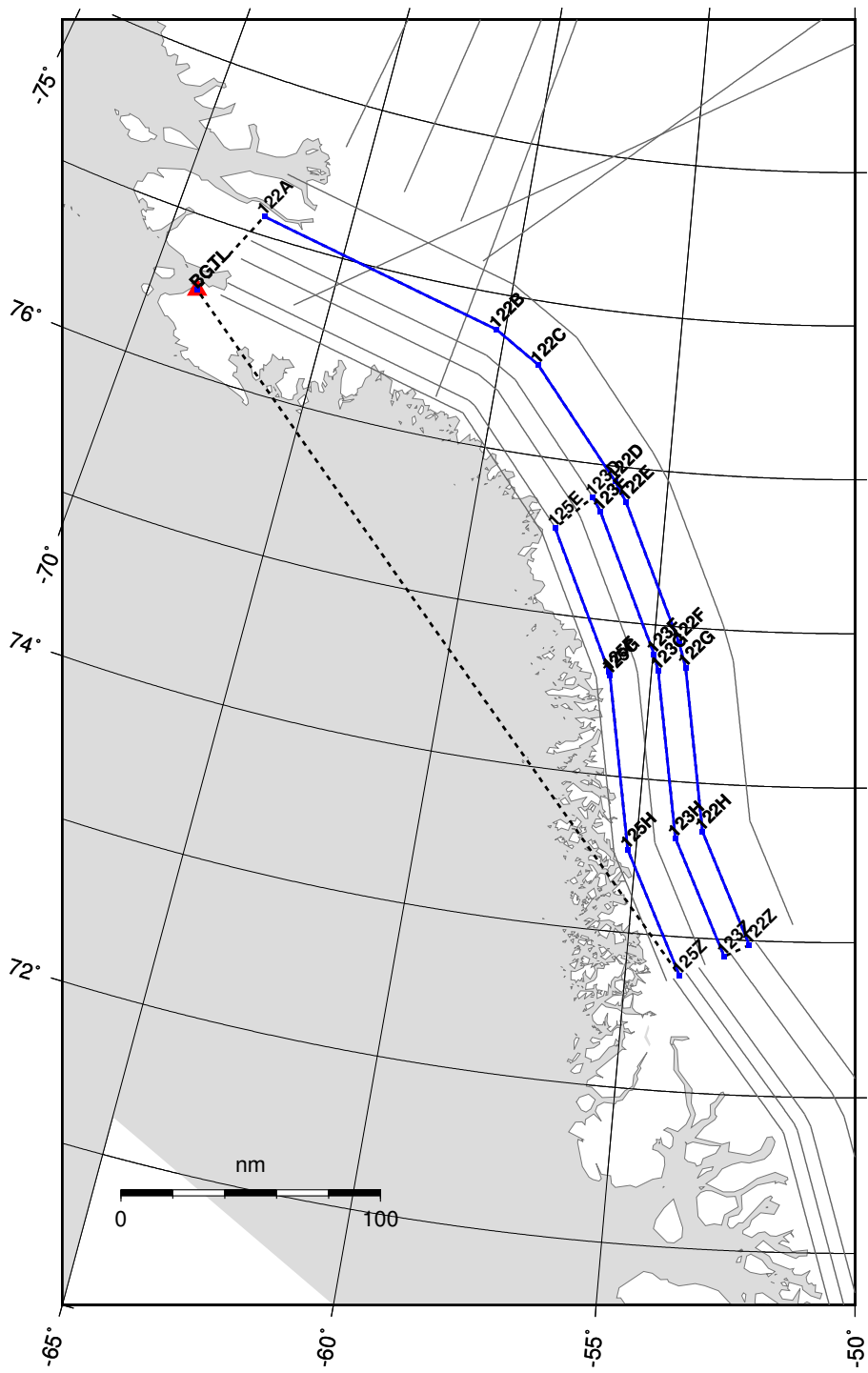Option is2north
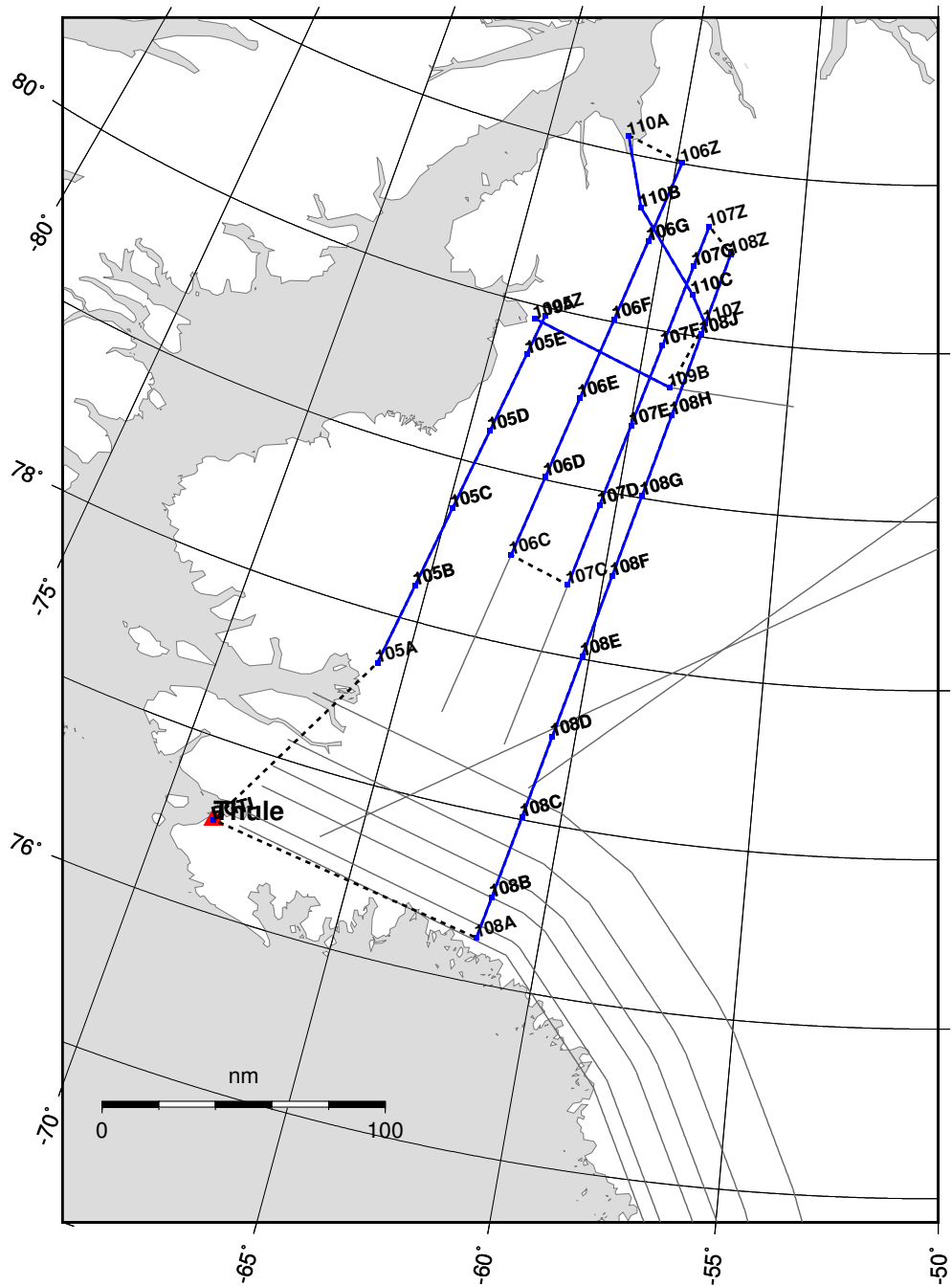
NorthWest Coastal 1

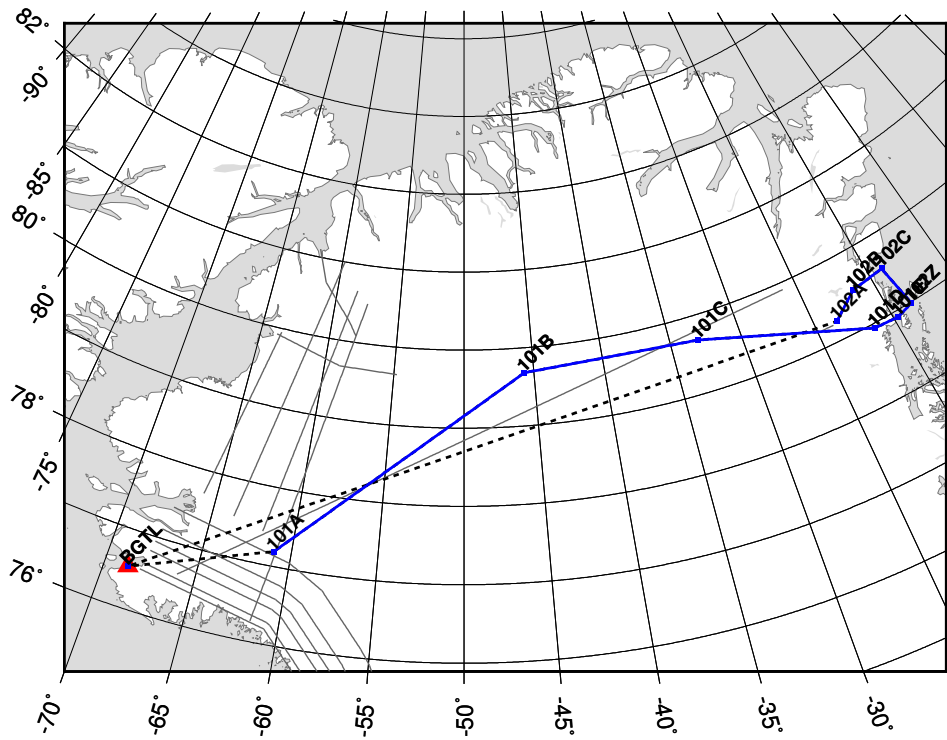Option nwgrid_1
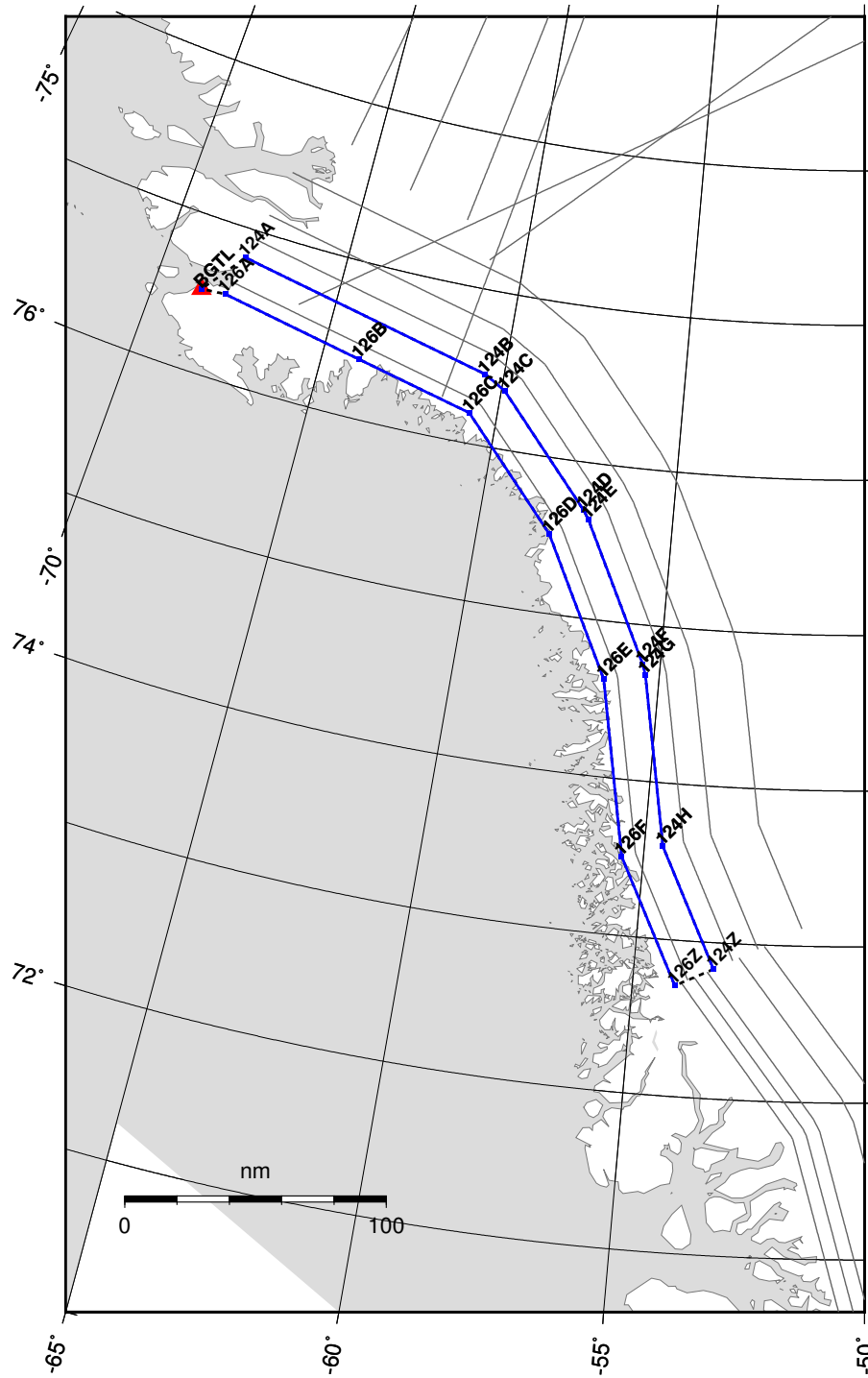
NorthWest Coastal 2

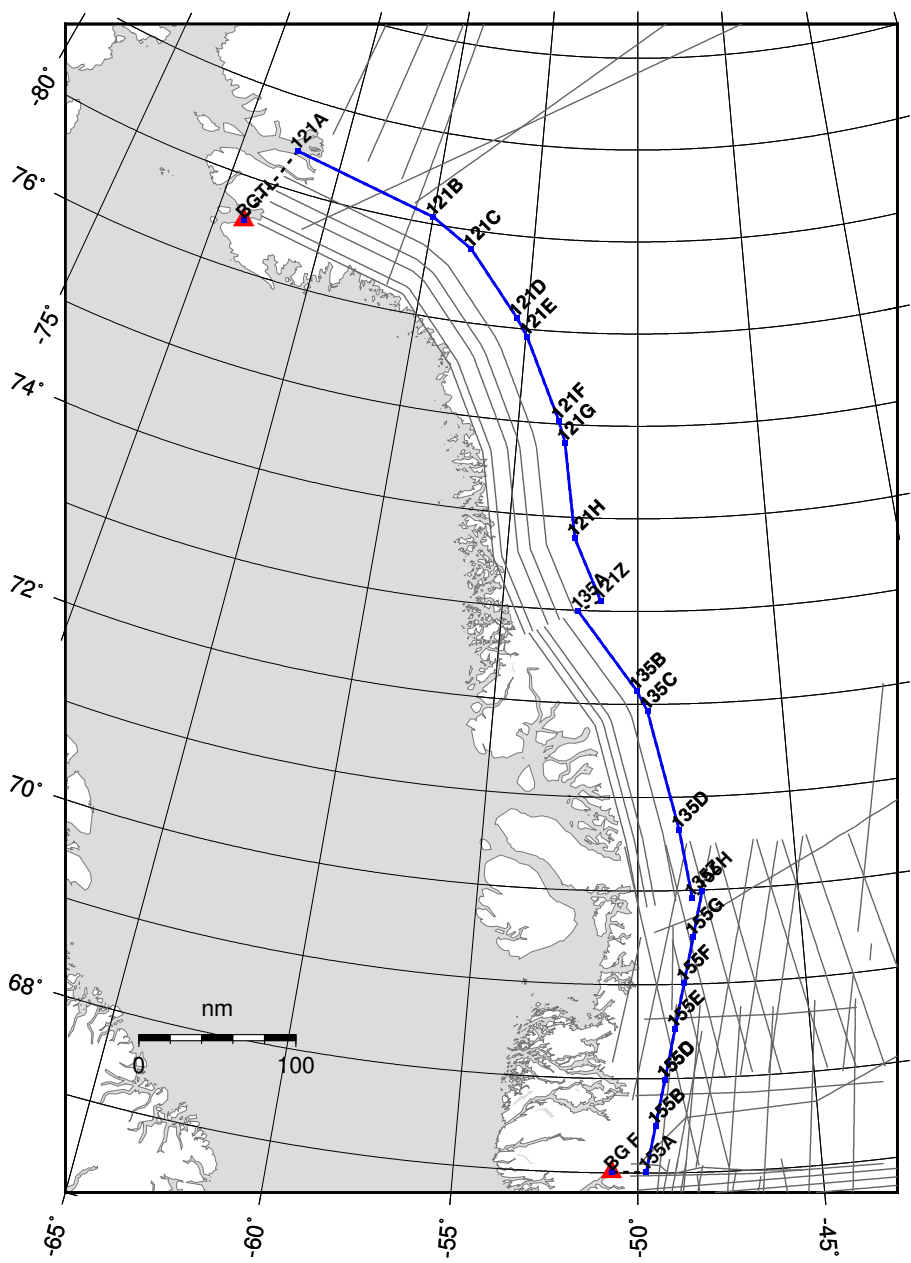Option nwgrid_2
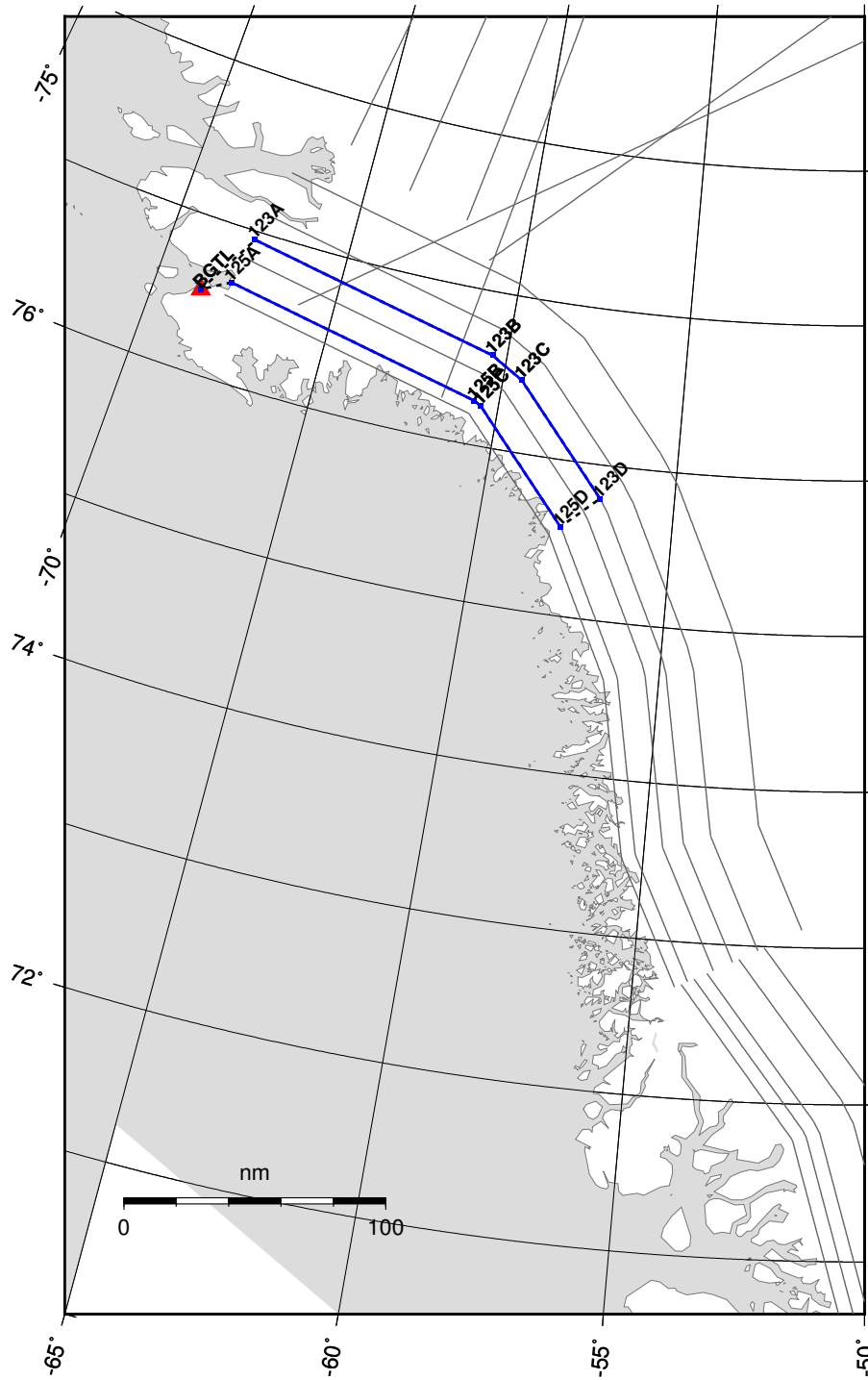
NorthWest Coastal 3

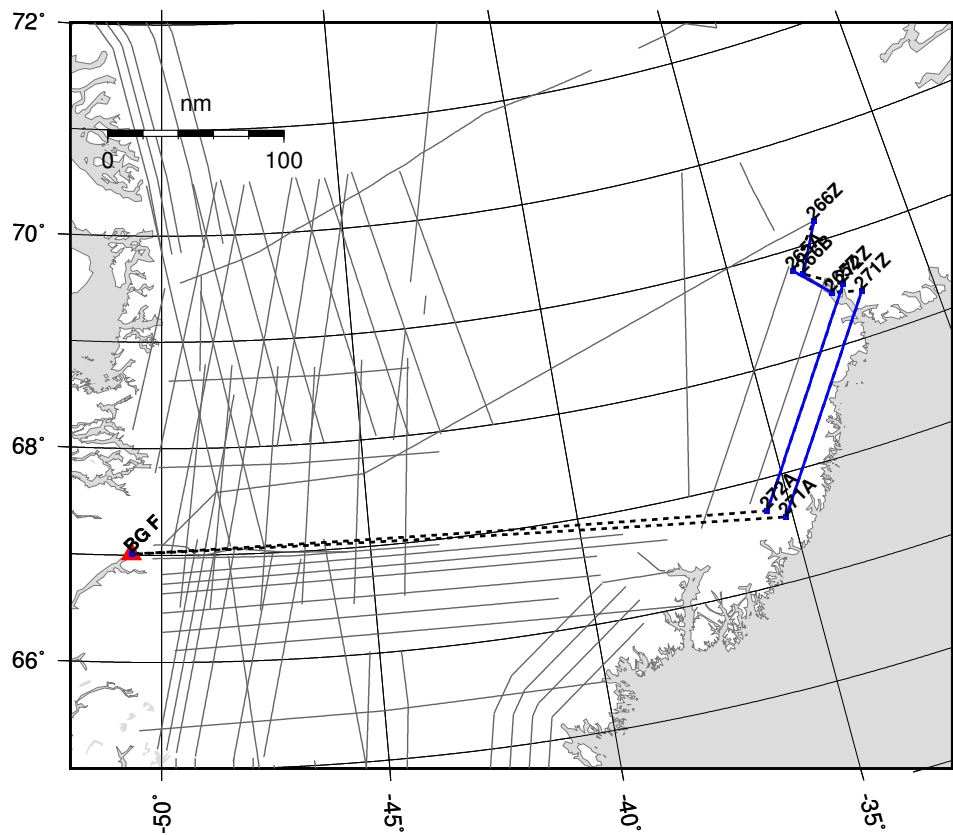Option nwgrid_3

Zachariae – 79N

Option zach

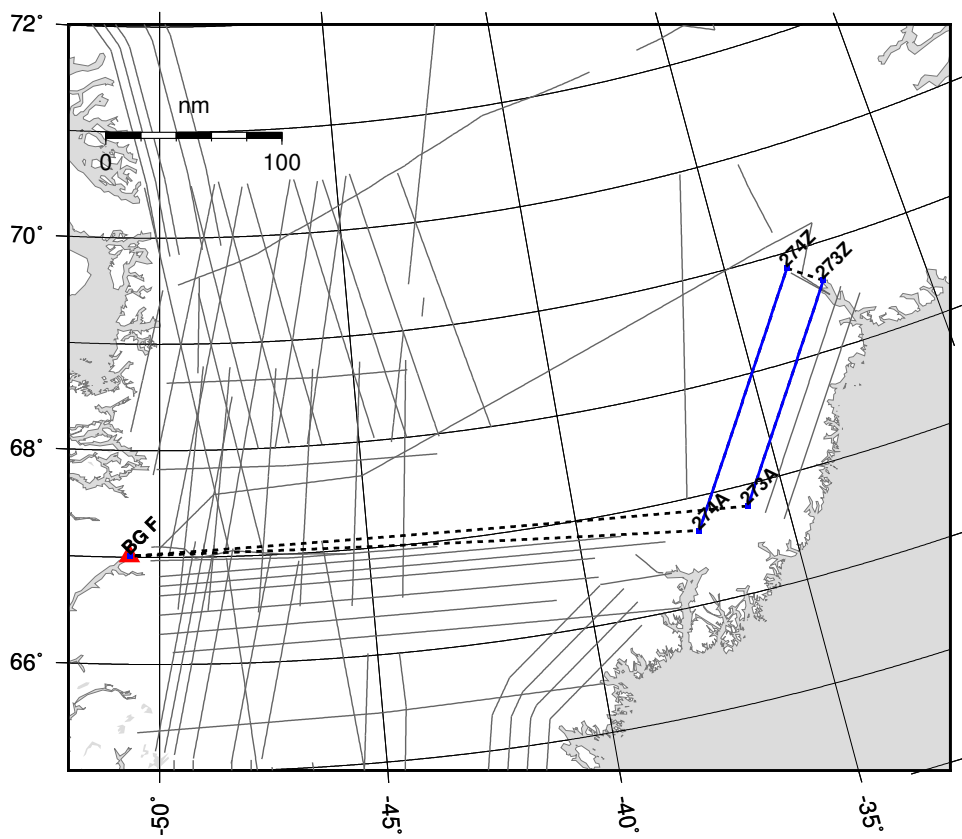# Transit to Kangerlussuaq

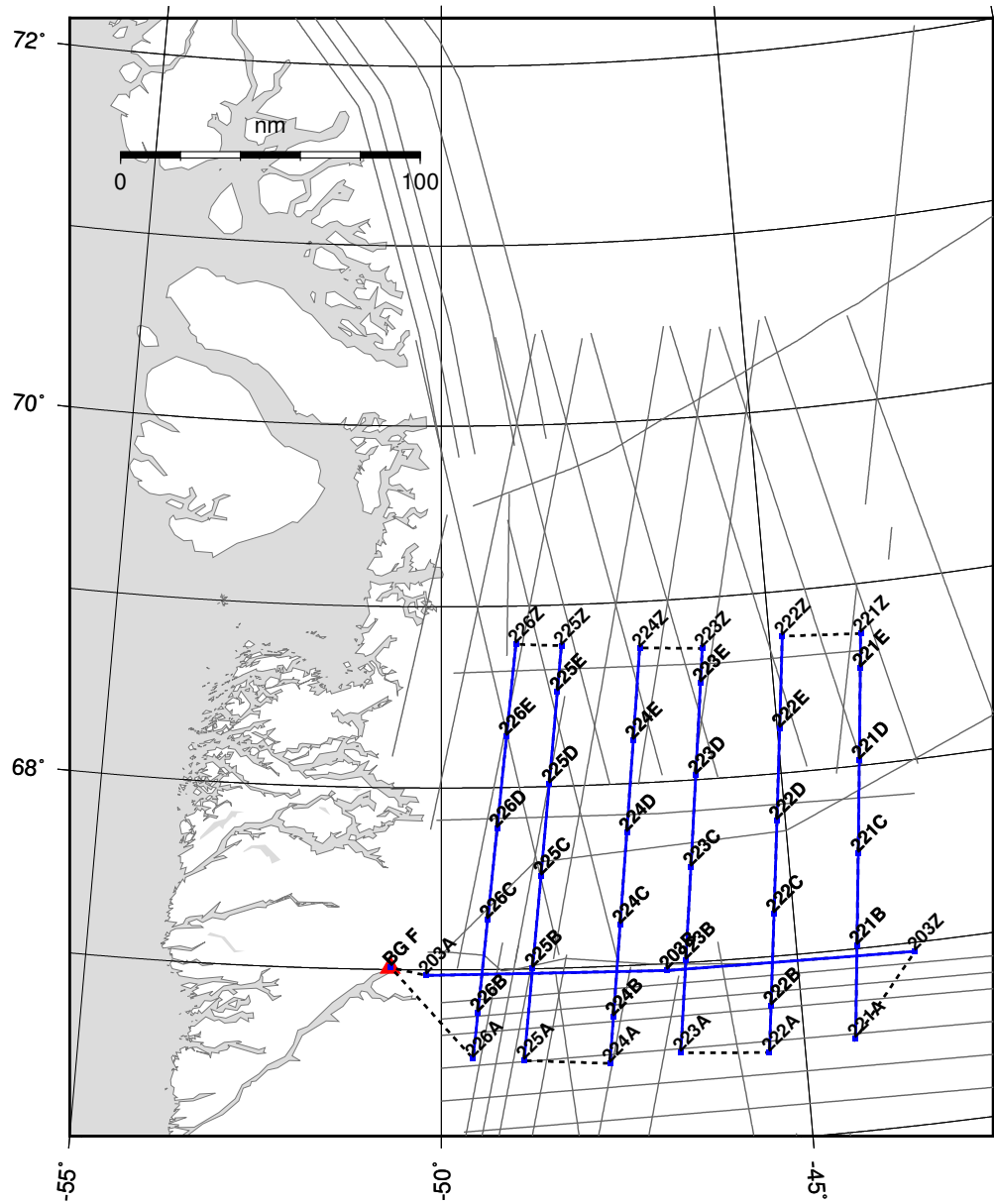Option- transit

Helheim-Kangerdlussuaq 1

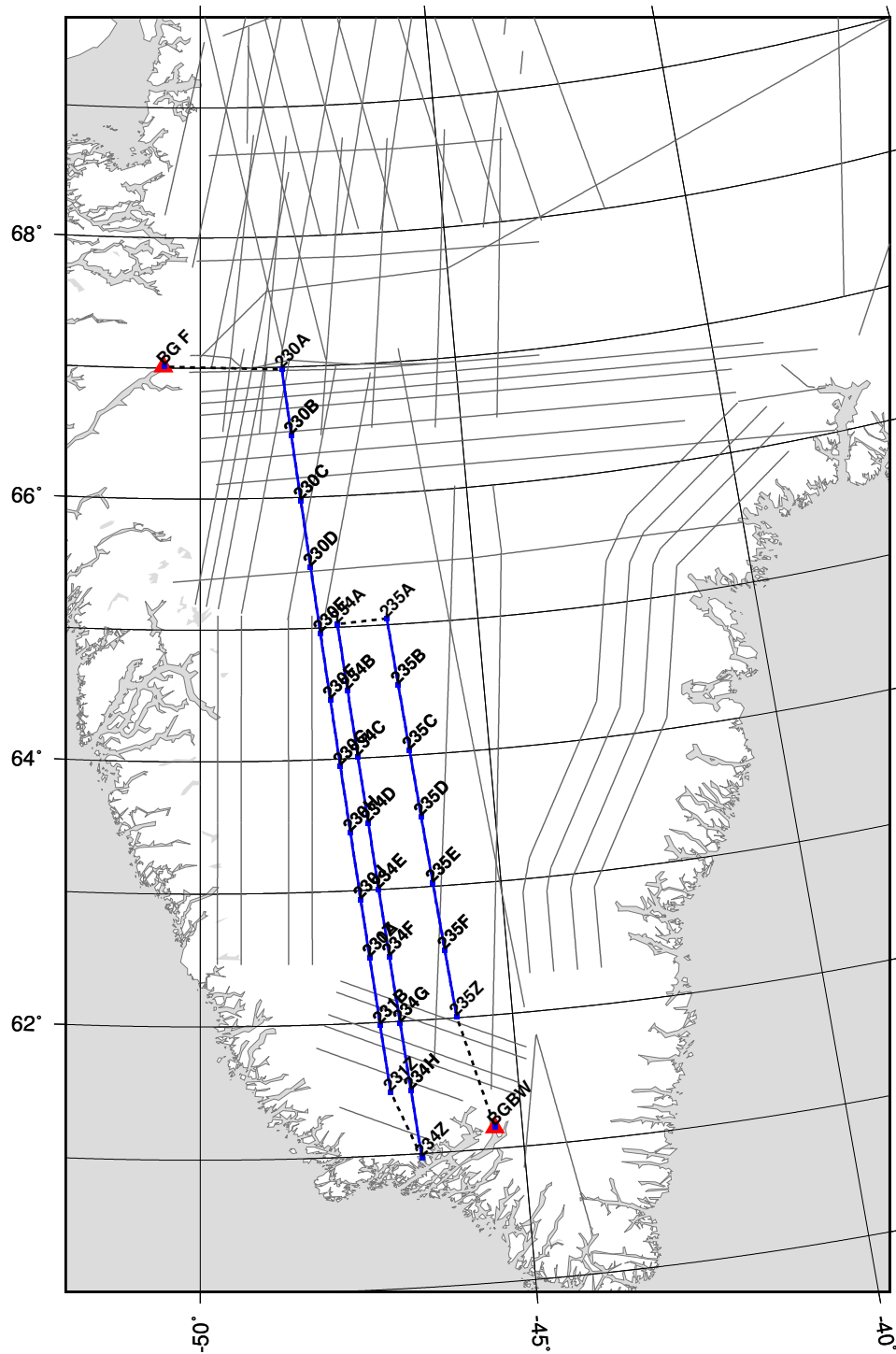Option HelKang1

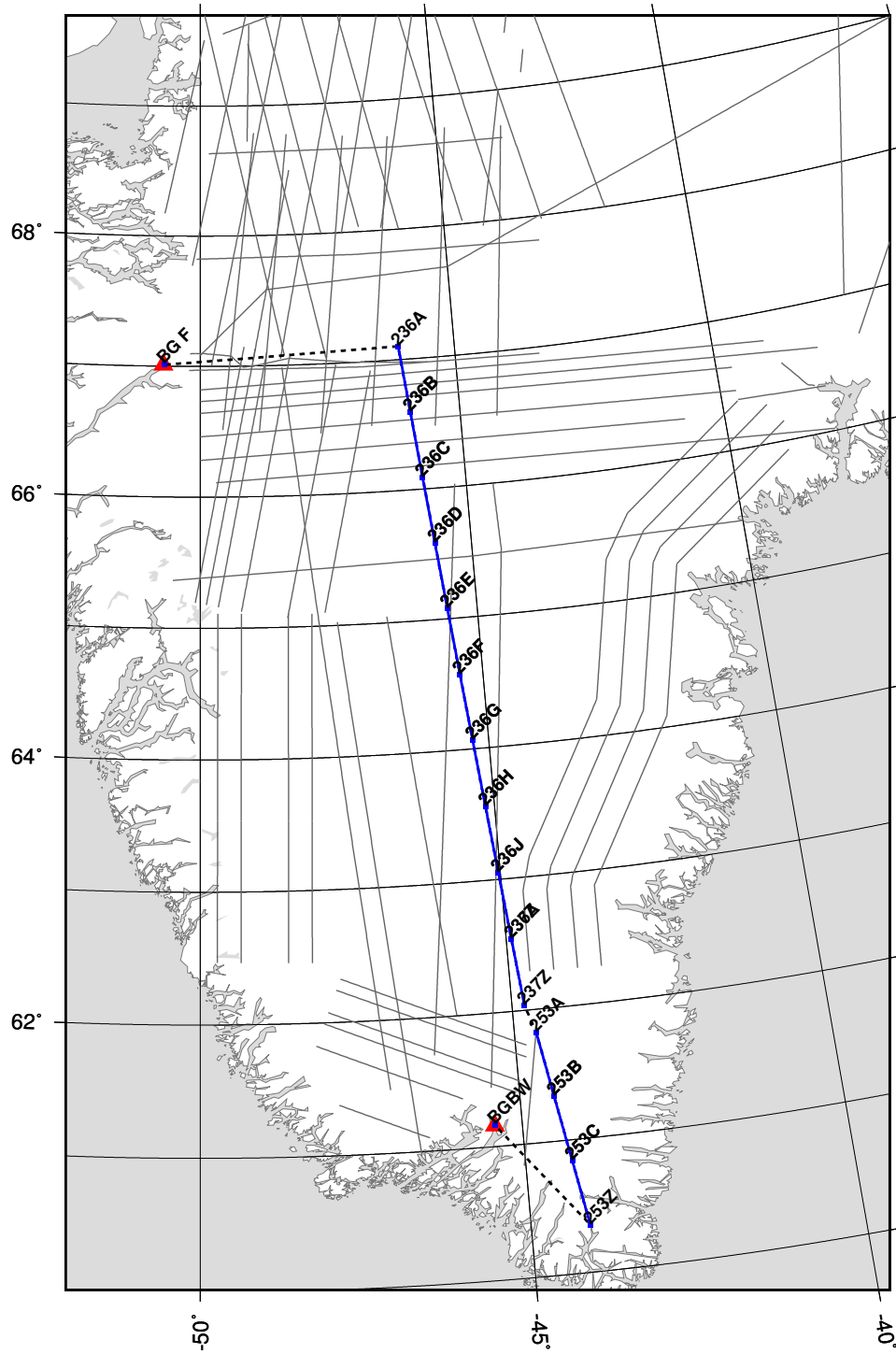# Helheim-Kangerdlussuaq 2

Option HelKang2

IceSat-2 Central
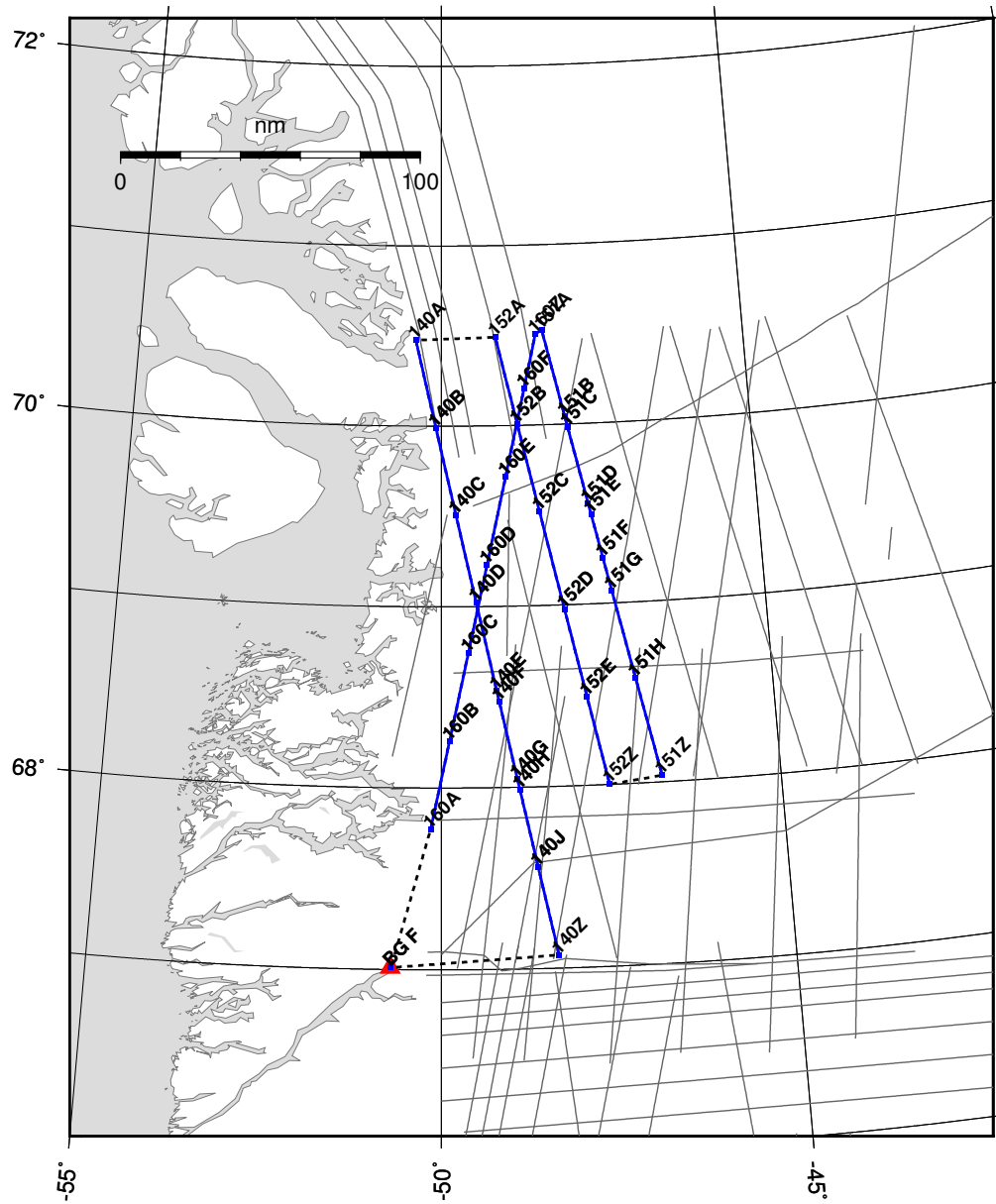
Option IS2central

IceSat-2 South 1
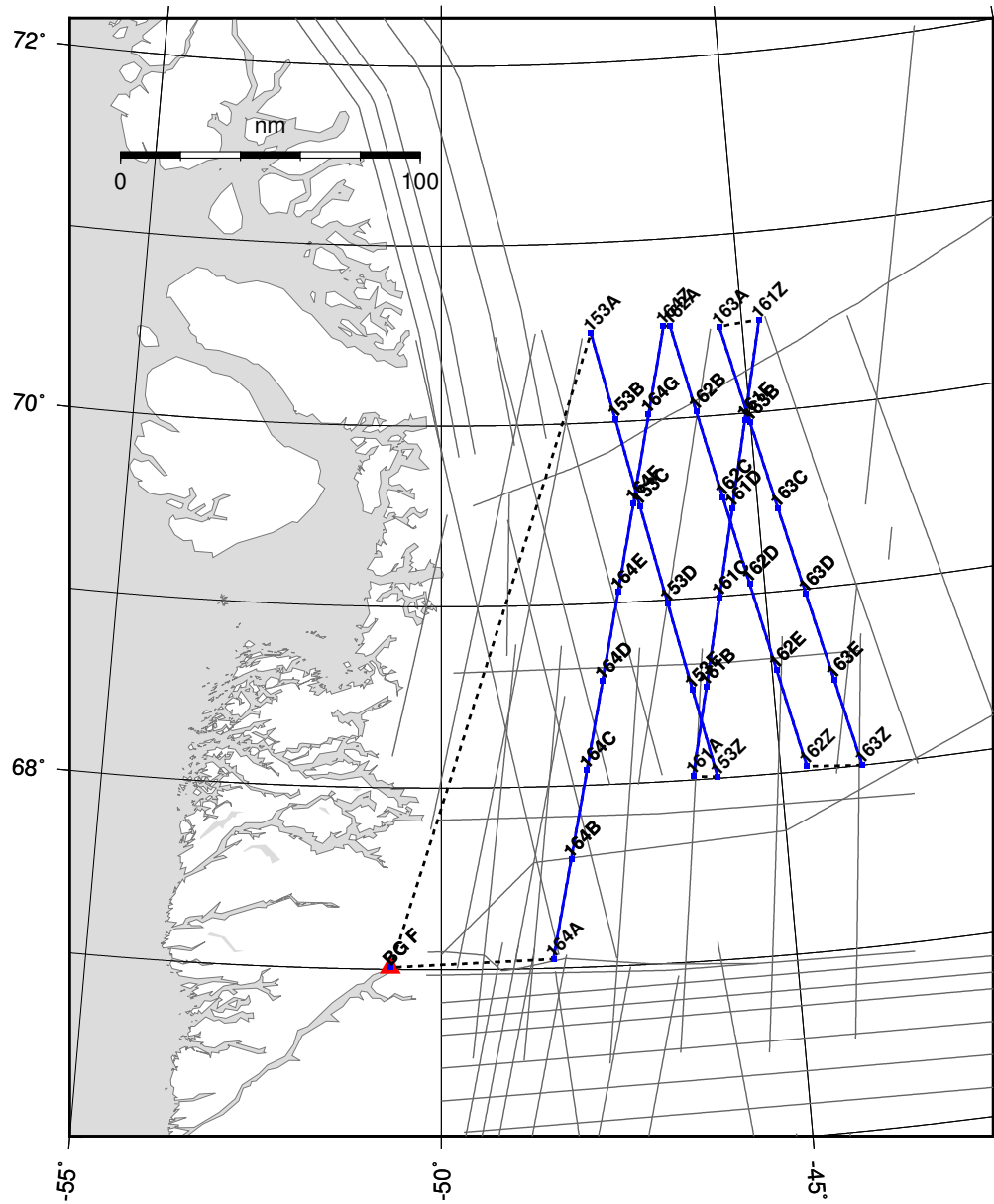
Option IS2South1

IceSat-2 South 2

Option IS2South2

Jakobshavn - Coast
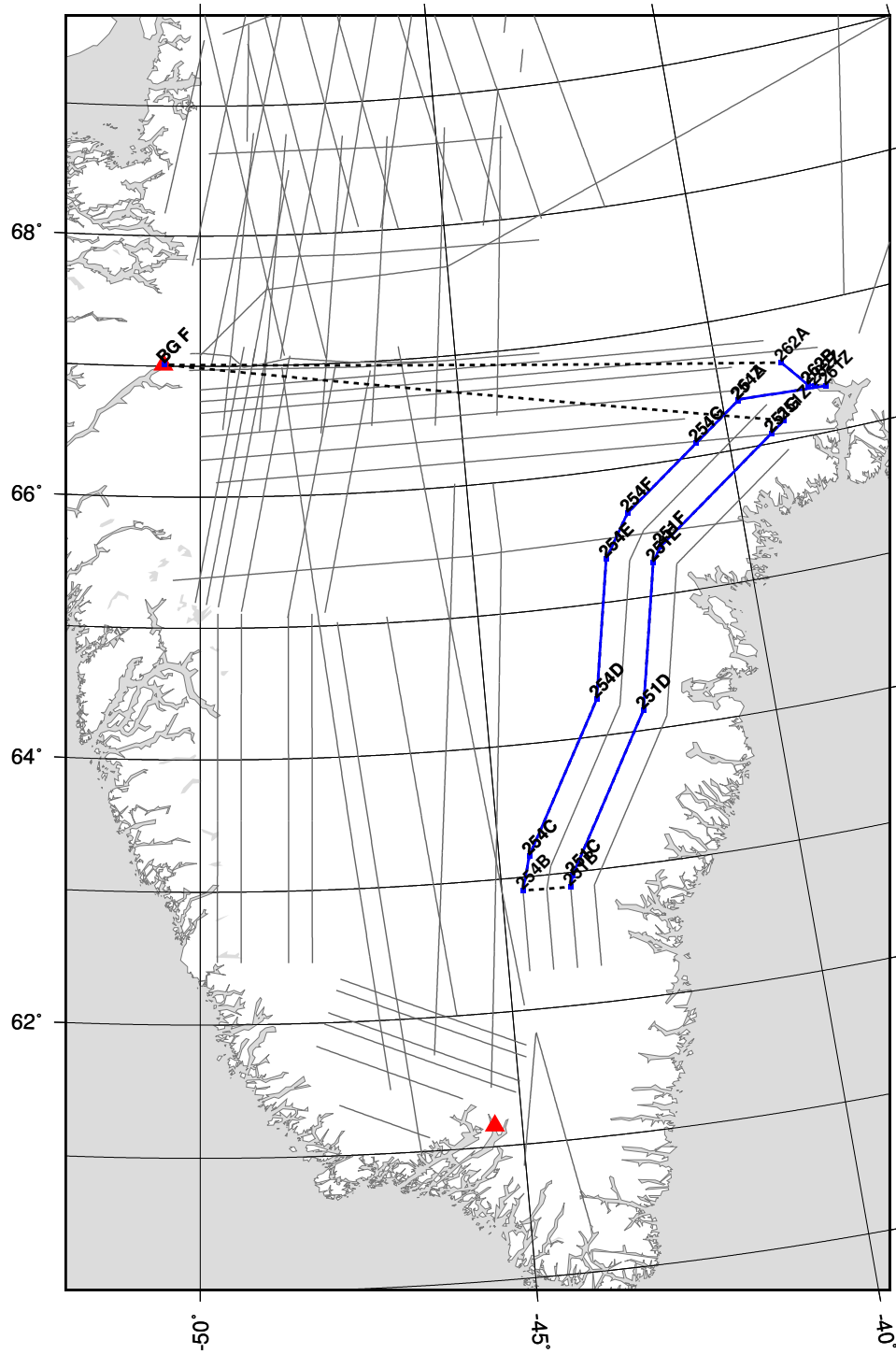
Option Jak_coast

Jakobshavn - Inland

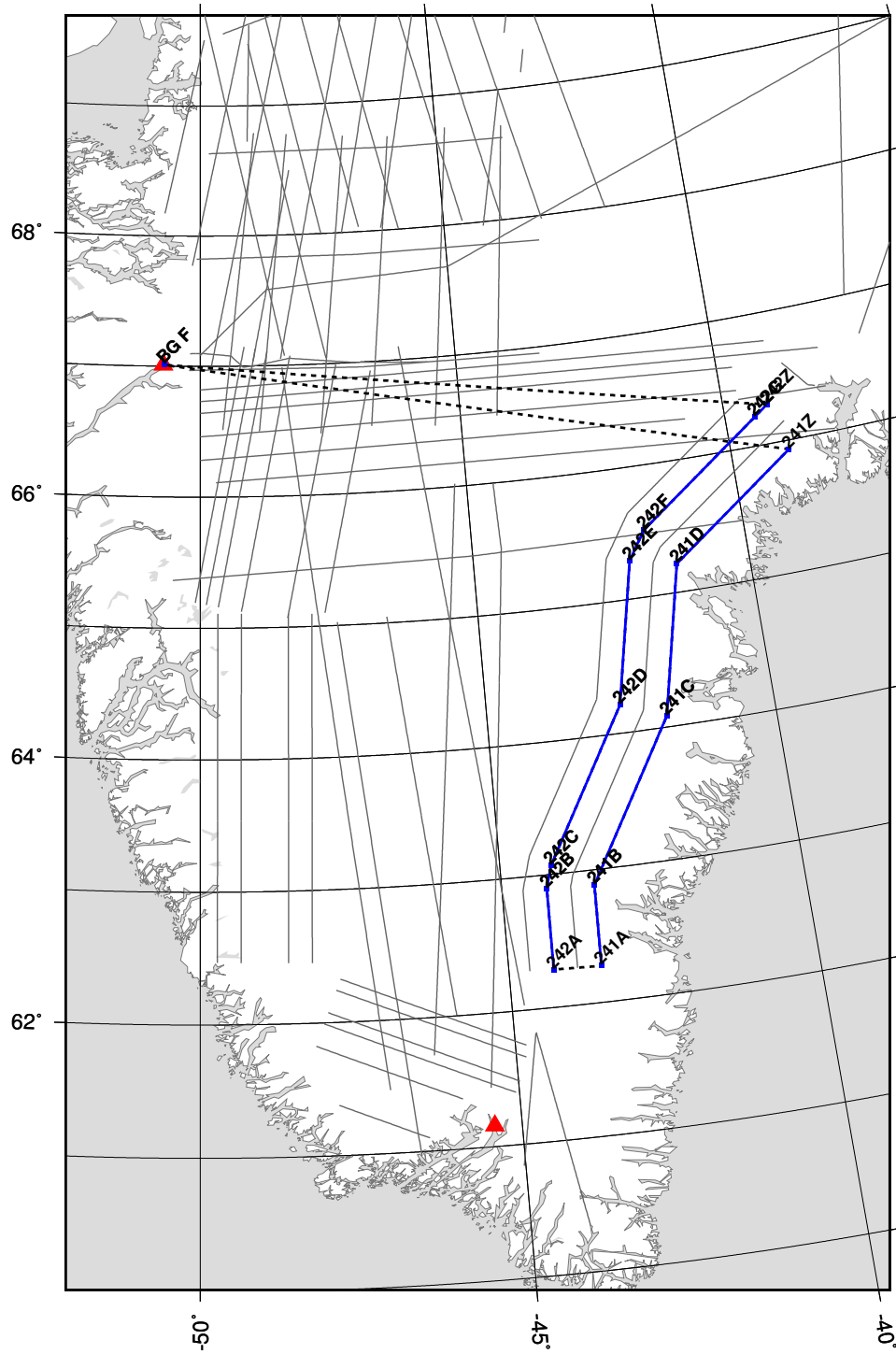Option Jak_inland

K Transect and Summit
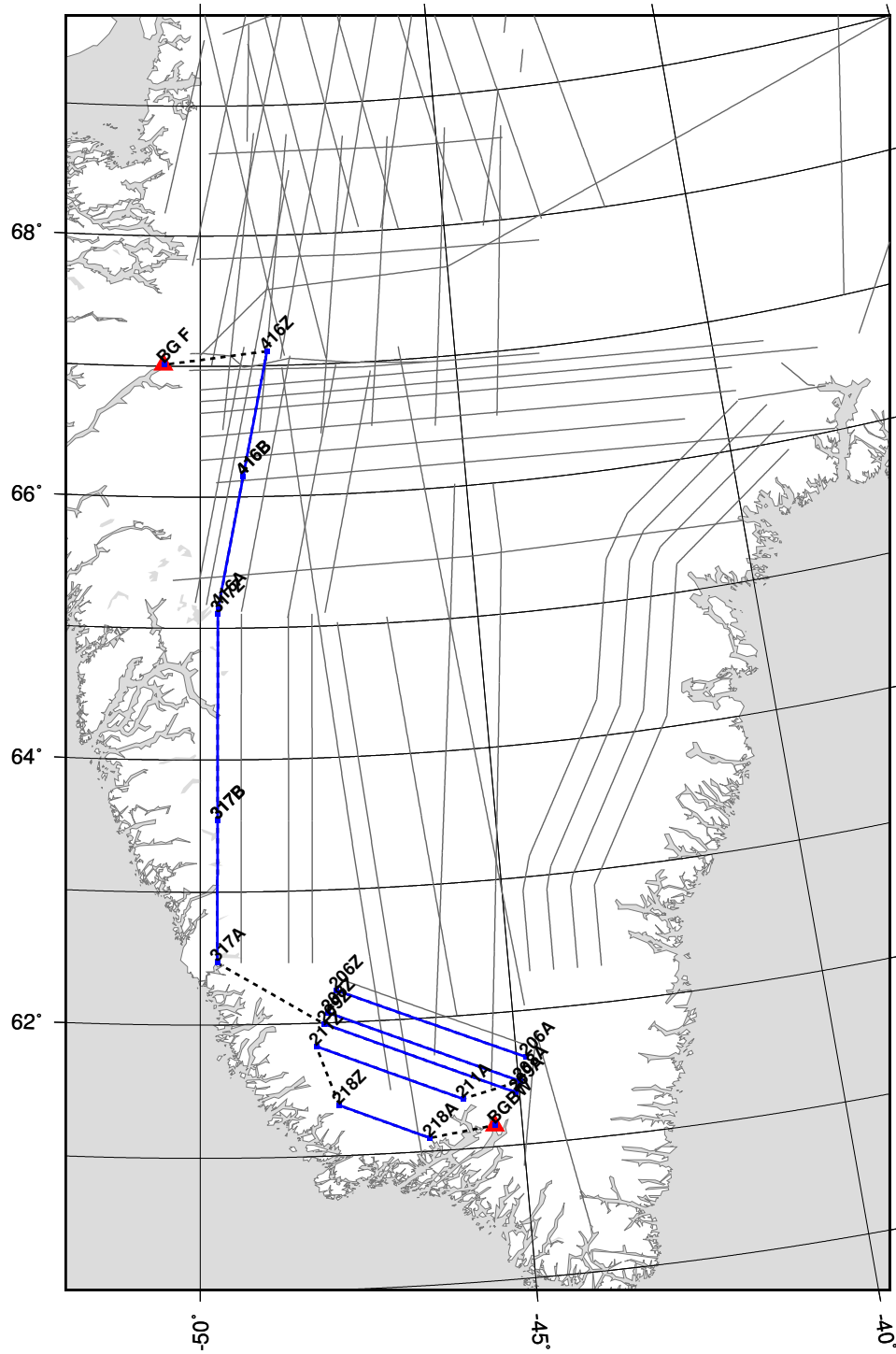
Option K-Summit
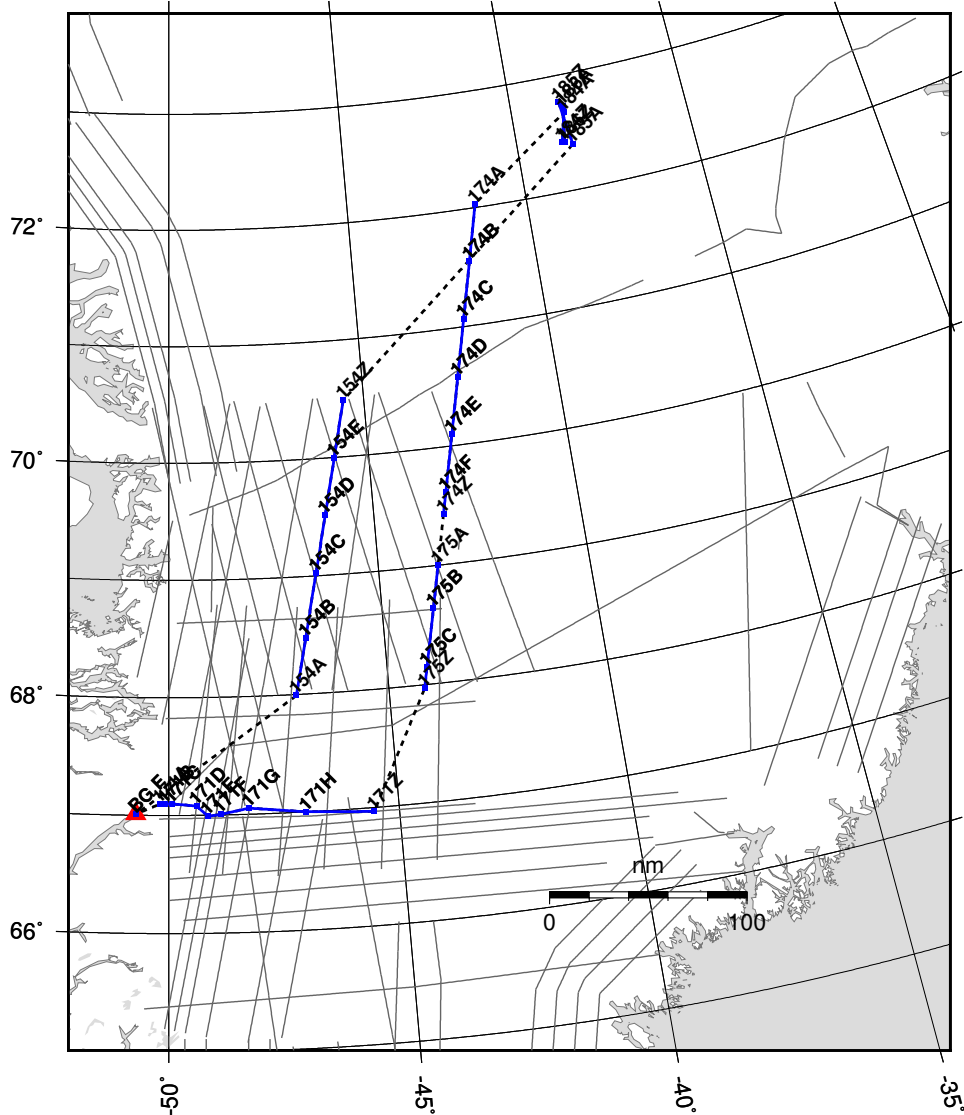
SE Grid 1
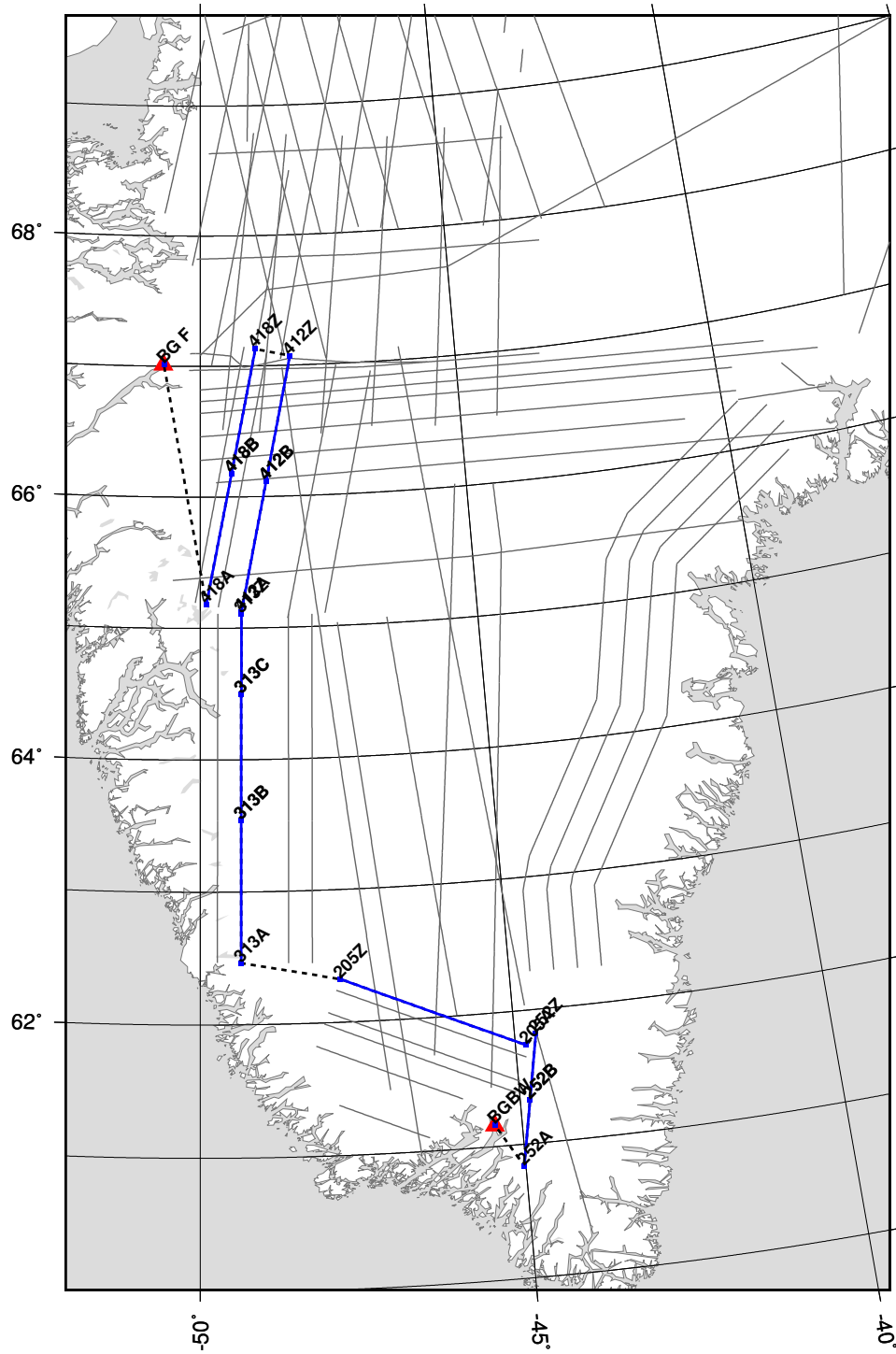
Option SEgrid1

SE Grid 2

Option SEgrid2
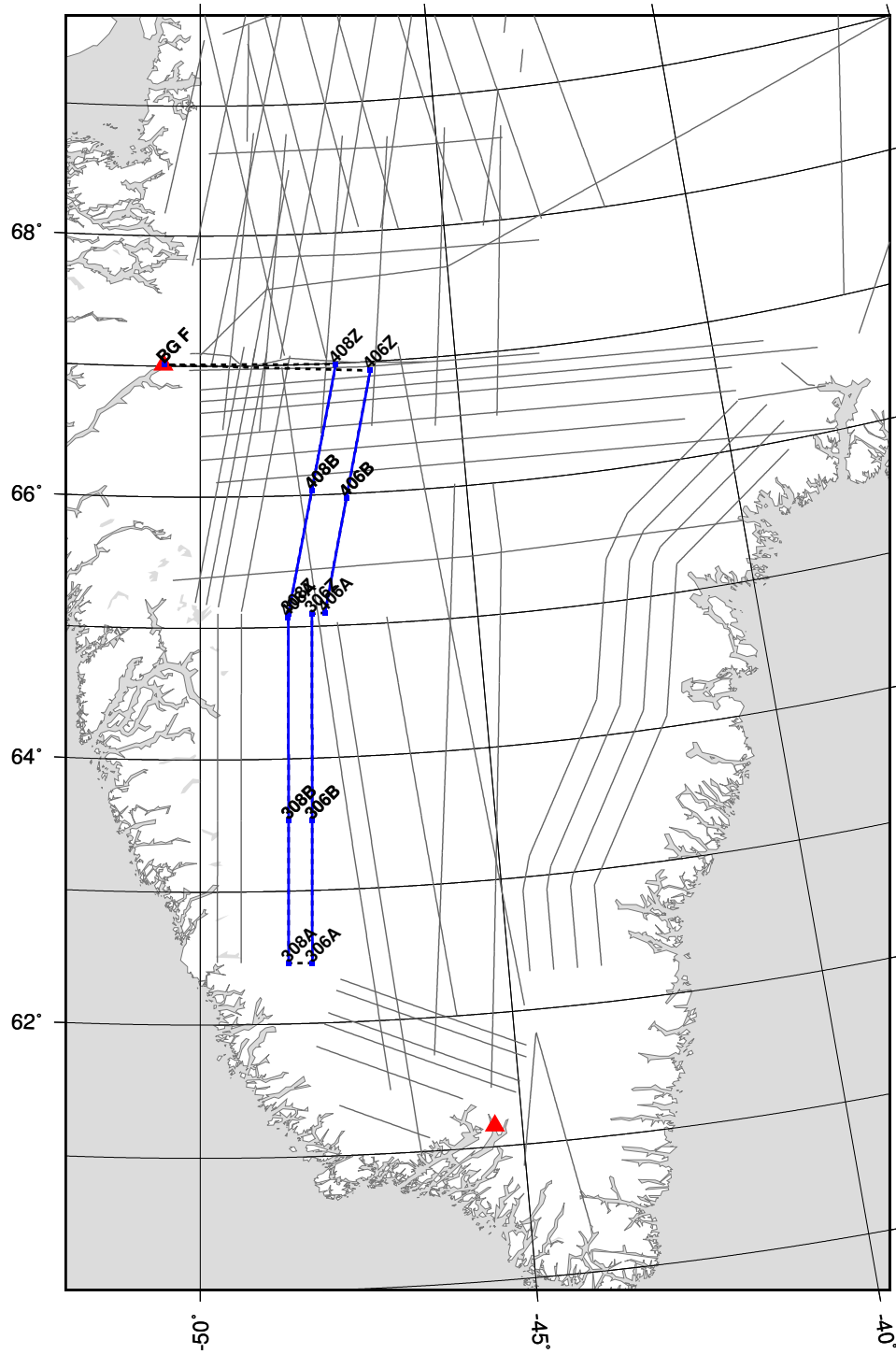
SW Coastal Grid 1

Option SWCoastal1

SW Coastal Grid 2

Option SWCoastal2

SW Coastal Grid 3

Option SWCoastal3

Umanaq

Option Ngrid